

*On the Structure of the Flower of the Gramineæ, the Functions of the Organs of which it is composed, and the Phenomena which accompany the act of Fecundation.* By M. BIDARD.

The flower of the Gramineæ is formed of a two-valved perigonium (glumella). The outer valve, which is always the larger, is in the form of a keel; its texture is coarse and parchment-like; and it embraces the inner valve with its margins all round. The inner valve is almost flat externally; its tissue is slight and transparent; at its margins it is folded inwards so as to form two screens, closed above and separated below. On its sides the inner valve is furnished with very numerous hairs.

The arrangement of these two valves is such that they form by their juxtaposition a completely closed chamber, the closure of which is rendered still more perfect by the hairs of the inner valve. Under such circumstances no foreign body can penetrate into the interior. In this chamber are enclosed the ovary and the organs of fecundation.

The stamens are three in number, and they occupy two-thirds of the space formed by the union of the two valves. Two of the stamens are placed one on each side of the ovary, and the third is opposite to it. The filaments do not exceed the ovary in length; at the base of the filaments, in front of the ovary, two glands (glumellulæ of botanists), varying in form according to the genus, occur in all the Gramineæ.

The ovary is surmounted by two stigmata, each of which is formed by a principal canal, upon which small canals are inserted laterally, having narrow tubes open at their extremity.

*Phenomena of Fecundation.*—The phenomena of fecundation occur when the organs of the flower have attained their full development. In the Gramineæ fecundation is instantaneous. It is manifested as follows:—

The anthers open laterally, become animated by a movement of torsion, and let fall a shower of pollen upon the stigma, which is spread out like a fan; at this moment the filaments become rapidly elongated; and by means of this elongation and of their movement of torsion the stamens separate the valves, force a passage, and hang down outside the flower. They are then almost empty. At this period the agriculturist says, "The corn is in flower;" but this is an error: the fecundation is completed.

The filaments of the stamens are not arranged in a spiral form, nor are they folded upon themselves. To effect their elongation they require perfectly prepared material; and this they find in the two glands placed at the base of the ovary: these contain a thick juice, which may be extracted by pricking them with a needle. The glands serve so well for the alimentation of the filaments, that they are emptied when the elongation takes place.

The pollen of the Gramineæ possesses no trace of a pollinic tube, nor could I in any case observe an ejection of fovilla. When the pollen falls upon the stigma, it attaches itself to the narrow tubes

which perforate the latter. These tubes, which are open at the extremity, play the part of suckers, which pump in the fovilla and transmit it through the canals to the ovary. After fecundation, the perforated pollen becomes dried up, whilst the stigma becomes folded upon itself and withers.

Consequently in the Gramineæ two principal phenomena occur, which are witnessed only in this family:—

1. The elongation and expulsion of the filaments of the stamens.
2. Fecundation by the perforation of the pollen.

These do not occur without reason.

The seed, the result of fecundation, must occupy when perfectly developed, the whole chamber formed by the union of the two valves. Now the stamens occupy two-thirds of this space, and by their volume they would obstruct the growth of the seed: they must be expelled; and hence the elongation of the filaments, and the existence and the utility of the alimentary glands.

As the fecundation is instantaneous, it is necessary that the fovilla should instantaneously penetrate to the ovary through the stigma, the existence of which only lasts during the moment of fecundation; hence the structure of the stigma, and the phenomenon of the perforation of the pollen.

All the facts that I have just indicated may be very easily observed in our cereals and the grasses of our meadows. To see the details of the fecundation, it is only necessary to split the outer valve longitudinally; by separating the two parts of this valve, we expose the organs of fecundation enclosed in the two curtains of the inner valve, and the warmth of the breath or a ray of the sun is sufficient to induce the phenomenon of fecundation.

The natural hybridization of the Gramineæ is impossible, from the exact closure of the space or chamber containing the organs of fecundation.—*Comptes Rendus*, June 21, 1869, tome lxxviii. p. 1486.

*On a Tree-Frog in New Granada which secretes a Poison employed by the Indians to poison their Arrows.* By J. ESCOBAR.

This tree-frog appears to belong to the species called *Phyllobates melanorhinus*. It is known in the country by the names of *Ranilla roja* or *rojiça*. During life it is of a red tint shaded with Naples yellow, and consequently rather yellowish red, like certain oranges, the colour of which approaches that of the citron. The yellow predominates when the animal has been some time in alcohol. There are two varieties—one in which the belly is black, and another in which it is of the same colour as the upper parts.

The poison is furnished by the dorsal region. It does not appear to possess its properties completely unless it is collected at the moment when the animal, still living, secretes it. To cause its secretion, they introduce into the mouth of the frog a small wooden spatula, and, taking great precautions in order not to produce injuries which would cause death too rapidly, push it in so as to cause great suffering, under the influence of which the whole upper surface of the